CLAIMS

1. A process for the production of carboxylic acid esters by reaction of a carboxylic acid selected from mono-, di- and polycarboxylic acids, with an alcohol in the presence of water of solution comprising the steps of:

(a) providing a solution comprising the carboxylic acid and the water of solution;

(b) reacting the solution of the carboxylic acid in an esterification zone with an alcohol to form an ester and water of esterification;

(c) removing the water of solution and the water of esterification; and

(d) recovering the ester.

2. A process according to Claim 1 wherein the process of the present invention is a continuous process.

3. A process according to Claim 1 or 2 wherein the water removed in step (c) is recycled to step (a).

4. A process according to any one of Claims 1 to 3 wherein the esterification is a mono- di- or polyesterification.

5. A process according to any one of Claims 1 to 4 wherein the feed in step (a) comprises from about 50 to about 70 wt% water.

6. A process according to any one of Claims 1 to 5 wherein the acid feed is processed prior to its supply to step (a) to reduce the water content.

7. A process according to any one of Claims 1 to 6 in which the solution of acid may be subjected to mono-esterification in parallel with a mono-esterification of a feed of anhydride.

8. A process according to any one of Claims 1 to 7 in which the esterification is a diesterification which occurs in a two-stage process.

9. A process according to Claim 8 in which the reaction of step (b) is carried out in an esterification zone comprising a first reactor in which the acid is converted to the mono ester and a second reactor in which the mono ester is converted to the diester.

10. A process according to any one of Claims 1 to 9 in which one or more heaters is provided in the esterification zone.

11. A process according to Claim 10 in which the heater is located in the or each reactor close to the feed point.

12. A process according to any one of Claims 1 to 11 in which water of solution and the water of esterification are substantially stripped out.

13. A process according to any one of Claims 1 to 12 in which the esterification is carried out in the presence of a catalyst.

14. A process according to any one of Claims 1 to 9 in which the esterification is a two step process and the second step is carried out in the presence of a catalyst.

15. A process according to Claim 13 or 14 in which the catalyst is a liquid catalyst.

16. A process according to any one of Claims 1 to 15 wherein the ester recovered in step (d) is contacted with a hydrogen containing stream in a hydrogenation zone containing a charge of a hydrogenation catalyst effective for catalytic hydrogenation to convert at least some of the ester to a desired product.

17. A process according to Claim 16 wherein the water of solution and water of esterification is removed prior to the ester being passed to the hydrogenation zone.

18. A process according to Claim 16 or 17 wherein hydrogenation is carried out in the vapour phase in the presence of a heterogeneous ester hydrogenation catalyst.

19. A process according to any one of Claims 16 to 18 wherein the alcohol is recovered from the hydrogenation zone and recycled to the esterification zone of step (a).

20. A process according to any one of Claims 1 to 19 wherein the process is for the production of di-(C_1 to C_4 alkyl) maleate, di-(C_1 to C_4 alkyl) succinate or a C_1 to C_4 alkyl ester of 3-hydroxypropionic acid.

21. A process according to any one of Claims 1 to 20 wherein the carboxylic acid provided in step (a) is maleic acid.

22. A process according to Claim 21 in which the maleic acid feed to be formed by hydrolysis of the product from a maleic anhydride reactor and the water rich stream recovered from the esterification zone is recycled to the absorber in which hydrolysis of the product from the maleic anhydride reactor is carried out.